

REMARKS

The Advisory Action mailed May 3, 2005, has been received and reviewed. Claims 1 through 4, 6 through 9 and 11 through 15 are currently pending in the application. Claims 1 through 4, 6 through 9 and 11 through 15 stand rejected. Claims 1 and 9 have been amended. New claims 16-19 are added but do not contain new matter. Reconsideration is respectfully requested.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. Re. 33,800 to Fornwalt et al.

Claims 9 and 11 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Fornwalt et al. (U.S. Patent No. Re. 33,800). Applicants respectfully traverse this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim 9 of the presently claimed invention recites as an element of the claimed invention an "etchant solution which selectively etches borophosphosilicate glass over tetraethyl orthosilicate, the etchant solution consisting of an organic acid selected from the group consisting of acetic acid, formic acid, and oxalic acid and a fluoride-containing solution, wherein the etchant solution exhibits a selectivity ratio of borophosphosilicate glass to tetraethyl orthosilicate between about 27:1 and 55:1." Applicants respectfully assert that Fornwalt fails to identically describe, either expressly or inherently, every element of the presently claimed invention. Specifically, Fornwalt fails to disclose an etchant solution "consisting of an organic acid selected from the group consisting of acetic acid, formic acid, and oxalic acid and a fluoride-containing solution" as recited in claim 9 of the presently claimed invention.

Additionally, Fornwalt fails to disclose that the etchant solution exhibits a selectivity ratio of borophosphosilicate glass to tetraethyl orthosilicate between about 27:1 and 55:1. While a “whereby” clause in *a method claim* that “merely states the result of the limitations in the claim adds nothing to the patentability or substance of the claim,” such is not the current case. *See, Texas Instrument Inc. v. Int’l Trade Comm’n*, 26 USPQ2d 1010 (Fed. Cir. 1993)(whereby clause in a *method claim* is not given weight when it simply expresses the intended result of a process step positively recited). Claims 9 and 11 of the presently claimed invention are not method claims. Further, the limitation “exhibits a selectivity ratio of borophosphosilicate glass to tetraethyl orthosilicate between about 27:1 and 55:1” states a condition that is material to patentability, and cannot be ignored. *See, Hoffer v. Microsoft Corp.*, -- USPQ2d --, 2005 WL 927148 (Fed. Cir. April 25, 2005). Applicants respectfully submit that the selectivity ratio is affected by the composition of the claimed etchant solution (ratio of organic acid and fluoride-containing solution) and must be given patentable weight. (*See*, Specification, Table 1).

As Fornwalt fails to identically describe, either expressly or inherently, every element of claim 9 of the presently claimed invention, applicants respectfully submit that claim 9 is allowable.

Claim 11 is further allowable as depending, either directly or indirectly, from allowable claim 9.

Anticipation Rejection Based on U.S. Patent No. 4,443,933 to DeBrebisson

Claims 9, 11 and 15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by DeBrebisson (U.S. Patent No. 4,443,933). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 9 of the presently claimed invention recites as an element of the claimed invention an “etchant solution which selectively etches borophosphosilicate glass over tetraethyl orthosilicate, the etchant solution consisting of an organic acid selected from the group consisting of acetic acid, formic acid, and oxalic acid and a fluoride-containing solution, wherein the etchant solution exhibits a selectivity ratio of borophosphosilicate glass to tetraethyl orthosilicate

between about 27:1 and 55:1.” Applicants respectfully submit that de Brebisson fails to identically describe, either expressly or inherently, every element of the presently claimed invention. Specifically, de Brebisson fails to identically describe the element of the claimed invention directed to etchant solution exhibits a selectivity ratio of borophosphosilicate glass to tetraethyl orthosilicate between about 27:1 and 55:1. While a “whereby” clause in *a method claim* that “merely states the result of the limitations in the claim adds nothing to the patentability or substance of the claim,” such is not the current case. *See, Texas Instrument Inc. v. Int’l Trade Comm’n*, 26 USPQ2d 1010 (Fed. Cir. 1993)(whereby clause in a method claim is not given weight when it simply expresses the intended result of a process step positively recited). Claims 9 and 11 of the presently claimed invention are not method claims. Further, the limitation “exhibits a selectivity ratio of borophosphosilicate glass to tetraethyl orthosilicate between about 27:1 and 55:1” states a condition that is material to patentability, and cannot be ignored. *See, Hoffer v. Microsoft Corp.*, -- USPQ2d --, 2005 WL 927148 (Fed. Cir. April 25, 2005). Applicants respectfully submit that the selectivity ratio is affected by the composition of the claimed etchant solution (ratio of organic acid and fluoride-containing solution) and must be given patentable weight. (*See*, Specification, Table 1).

As de Brebisson fails to identically describe, either expressly or inherently, every element of claim 9 of the presently claimed invention, applicants respectfully submit that claim 9 is allowable.

Claims 11 and 15 are further allowable as depending, either directly or indirectly, from allowable claim 9.

Anticipation Rejection Based on U.S. Patent No. 4,395,304 to Kern et al.

Claims 9, 11 and 12 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kern et al. (U.S. Patent No. 4,395,304). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 9 of the presently claimed invention recites as an element of the claimed invention an “etchant solution which selectively etches borophosphosilicate glass over tetraethyl

orthosilicate, the etchant solution consisting of an organic acid selected from the group consisting of acetic acid, formic acid, and oxalic acid and a fluoride-containing solution, wherein the etchant solution exhibits a selectivity ratio of borophosphosilicate glass to tetraethyl orthosilicate between about 27:1 and 55:1.” Applicants respectfully submit that Kern fails to identically describe, either expressly or inherently, every element of the presently claimed invention. Kern fails to disclose an etchant solution “consisting of an organic acid selected from the group consisting of acetic acid, formic acid, and oxalic acid and a fluoride-containing solution” as recited in claim 9 of the presently claimed invention.

Kern fails to identically describe that the etchant solution exhibits a selectivity ratio of borophosphosilicate glass to tetraethyl orthosilicate between about 27:1 and 55:1. While a “whereby” clause in *a method claim* that “merely states the result of the limitations in the claim adds nothing to the patentability or substance of the claim,” such is not the current case. *See, Texas Instrument Inc. v. Int’l Trade Comm’n*, 26 USPQ2d 1010 (Fed. Cir. 1993)(whereby clause in a method claim is not given weight when it simply expresses the intended result of a process step positively recited). Claims 9 and 11 of the presently claimed invention are not method claims. Further, the limitation “exhibits a selectivity ratio of borophosphosilicate glass to tetraethyl orthosilicate between about 27:1 and 55:1” states a condition that is material to patentability, and cannot be ignored. *See, Hoffer v. Microsoft Corp.*, -- USPQ2d --, 2005 WL 927148 (Fed. Cir. April 25, 2005). Applicants respectfully submit that the selectivity ratio is affected by the composition of the claimed etchant solution (ratio of organic acid and fluoride-containing solution) and must be given patentable weight. (*See*, Specification, Table 1).

Similarly, the inclusion of water in the Kern solution would impact the selectivity ratio of the solution. As Kern fails to identically describe, either expressly or inherently, every element of claim 9 of the presently claimed invention, applicants respectfully submit that claim 9 is allowable.

Claims 11 and 12 are further allowable as depending, either directly or indirectly, from allowable claim 9.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 4,395,304 to Kern et al. in view of U.S. Patent No. 4,721,548 to Morimoto

Claims 13 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kern et al. (U.S. Patent No. 4,395,304) in view of Morimoto (U.S. Patent No. 4,721,548). Applicants respectfully traverse this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The Court of Appeals for the Federal Circuit has stated that "dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious." *In re Fine*, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988). See also MPEP § 2143.03. Having failed to teach or suggest each and every limitation of independent claim 9, the prior art referenced as rendering dependent claims 13 and 14 obvious, cannot serve as a basis for rejection.

Obviousness Rejection Based on U.S. Patent No. Re. 33,800 to Fornwalt et al. in view of U.S. Patent No. 4,721,548 to Morimoto

Claims 1 through 3 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fornwalt et al. (U.S. Patent No. Re. 33,800) in view of Morimoto (U.S. Patent No. 4,721,548). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 1 of the presently claimed invention recites the claim limitation calling for an “etchant solution which selectively etches borophosphosilicate glass over tetraethyl orthosilicate, the etchant solution consisting of an organic acid and a fluoride-containing solution provided in a selected volumetric ratio relative to one another, wherein the selected volumetric ratio of the organic acid to the fluoride-containing solution is about 10:1 to about 500:1.” Applicants respectfully submit that the combination of Fornwalt and Morimoto fails to teach or suggest all the claim limitations of the presently claimed invention to establish a *prima facie* case of obviousness under 35 U.S.C. § 103. As stated by the Examiner, Fornwalt fails to disclose the claimed volume ratio of organic acid and the fluoride-containing solution. However, the combination with Morimoto fails to correct this deficiency. Morimoto discloses a solution of hydrofluoric acid, nitric acid and acetic acid. (Morimoto, col. 3 lines 13-15). The inclusion of nitric acid is not allowed with the closed language of the presently claimed invention. Morimoto does not teach or suggest that the claimed ratio would be successful. Because the Morimoto solution includes additional component, Morimoto does not teach or suggest that the same ratio would be successful if the nitric acid were removed. As the combination of Fornwalt and Morimoto fails to teach or suggest all the claim limitations of the presently claimed invention, applicants respectfully submit that claim 1 is allowable.

Claims 2 through 3 and 8 are allowable as depending from allowable claim 1.

Claim 8 is further allowable as the combination fails to teach or suggest that the etchant solution exhibits a selectivity ration of borophosphosilicate glass to tetraethyl orthosilicate between about 27:1 and 55:1.

Obviousness Rejection Based on U.S. Patent No. 4,395,304 to Kern et al. in view of U.S. Patent No. 4,721,548 to Morimoto

Claims 1 through 4 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kern et al. (U.S. Patent No. 4,395,304) in view of Morimoto (U.S. Patent No. 4,721,548). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 1 of the presently claimed invention recites a claim limitation calling for an "etchant solution which selectively etches borophosphosilicate glass over tetraethyl orthosilicate, the etchant solution consisting of an organic acid and a fluoride-containing solution provided in a selected volumetric ratio relative to one another, wherein the selected volumetric ratio of the organic acid to the fluoride-containing solution is about 10:1 to about 500:1." Applicants respectfully submit that the combination of Kern and Morimoto fails to teach or suggest all the claim limitations of the presently claimed invention to establish a *prima facie* case of obviousness under 35 U.S.C. § 103. As stated by the Examiner, Kern fails to disclose the claimed volume ratio of organic acid and the fluoride-containing solution. However, the combination with Morimoto fails to correct this deficiency. Morimoto discloses a solution of hydrofluoric acid, nitric acid and acetic acid. (Morimoto, col. 3 lines 13-15). The inclusion of nitric acid would not be permissible in the closed language of claim 1. Morimoto does not teach or suggest that the claimed ratio would be successful. Because the Morimoto solution includes additional component, Morimoto does not teach or suggest that the same ratio would be successful if the nitric acid were removed. As the combination of Kern and Morimoto fails to teach or suggest all the claim limitations of the presently claimed invention, applicants respectfully submit that claim 1 is allowable.

Claims 2 through 3 and 8 are allowable as depending from allowable claim 1.

Claim 8 is further allowable as the combination fails to teach or suggest that the etchant solution exhibits a selectivity ration of borophosphosilicate glass to tetraethyl orthosilicate between about 27:1 and 55:1.

Obviousness Rejection Based on U.S. Patent No. 4,443,933 to DeBrebisson in view of U.S. Patent No. 4,721,548 to Morimoto

Claims 1 through 3 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over DeBrebisson (U.S. Patent No. 4,443,933) in view of Morimoto (U.S. Patent No. 4,721,548). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 1 of the presently claimed invention recites the claim limitation calling for an "etchant solution which selectively etches borophosphosilicate glass over tetraethyl orthosilicate, the etchant solution consisting of an organic acid and a fluoride-containing solution provided in a selected volumetric ratio relative to one another, wherein the selected volumetric ratio of the organic acid to the fluoride-containing solution is about 10:1 to about 500:1." Applicants respectfully submit that the combination of de Brebisson and Morimoto fails to teach or suggest all the claim limitations of the presently claimed invention to establish a *prima facie* case of obviousness under 35 U.S.C. § 103. As stated by the Examiner, de Brebisson fails to disclose the claimed volume ratio of organic acid and the fluoride-containing solution. However, the combination with Morimoto fails to correct this deficiency. Morimoto discloses a solution of hydrofluoric acid, nitric acid and acetic acid. (Morimoto, col. 3 lines 13-15). The inclusion of nitric acid is not permitted in the closed language of the presently claimed invention. Morimoto does not teach or suggest that the claimed ratio would be successful. Because the Morimoto solution includes additional component, Morimoto does not teach or suggest that the same ratio would be successful if the nitric acid were removed. As the combination of de Brebisson and Morimoto fails to teach or suggest all the claim limitations of the presently claimed invention, applicants respectfully submit that claim 1 is allowable.

Claims 2 through 3 and 8 are allowable as depending from allowable claim 1.

Claim 8 is further allowable as the combination fails to teach or suggest that the etchant solution exhibits a selectivity ration of borophosphosilicate glass to tetraethyl orthosilicate between about 27:1 and 55:1.

New Claims

New claims 16-19 were added. Support for these claims can be found throughout the as-filed specification, including, as-filed claim 2, page 3, lines 12-14. Applicants respectfully submit the cited art does not disclose an etchant solution consisting of oxalic acid and a fluoride-containing solution. Accordingly, claims 16 – 19 are each allowable.

CONCLUSION

Claims 1-4, 6-9 and 11-19 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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